



**REPORT on Sanitary Matters
in the Districts of Moka and
Pamplemousses.**



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REPORT

ON SANITARY MATTERS IN THE DISTRICTS OF MOKA AND PAMPLEMOUSSES

No. 242/R/110.

GOVERNMENT HOUSE,
PORT LOUIS,
7th September, 1921.

HONOURABLE COLONIAL SECRETARY.

SIR.—I have the honour to submit a report on sanitary matters in the Districts of Moka and Pamplemousses.

MOKA

This important district now has a population of 29,892. Its southern part is very sparsely peopled but elsewhere there are many large villages though no town of importance. The rainfall is heavy and consequently, the sanitary conditions being faulty, the incidence of ankylostomiasis is very high. Indeed Moka is the most heavily infected district in Mauritius, Kendrick placing the percentage infection at 90.6. The estates of Pieter Both and Mon Désert and the C. of E. Aided School at Quartier Militaire actually showed 100 per cent. infection. Typhoid fever is said to be prevalent in Moka District. Between January 1st and July 21st of this year, 14 cases had been notified. In all probability many other cases occurred and it is likely that paratyphoid infections are frequent.

Malaria is still in evidence at Pailles and Mont Orry and is found elsewhere, especially in places where anti-malarial work has been neglected by sugar estates, as for example at Alma.

Dysentery is said to be on the decrease while phthisis and influenza are very prevalent.

I am indebted to the Deputy of the District, the Hon. Martial Noël, for information regarding it.

The inspections comprised the following :—

TOWNS AND VILLAGES.—Quartier Militaire, Montagne Blanche, Dagotière, Moka, Mont Orry, St. Pierre, Petit Verger, Circonstance, Avenir, Pailles.

SUGAR ESTATES.—Sans Souci, Melrose, Bonne Veine, Alma, Mon Désert, Avenir, Beau Bois, Cascade, Côte d'Or.

SCHOOLS.—R. C. Aided and C. of E. Aided Schools, Quartier Militaire ; C. of E. Aided School, Montagne Blanche ; R. C. Aided School, St. Pierre ; R. C. Aided School, Helvetia ; Government School, Moka ; R. C. Aided School, Pailles ; Government School, Beau Bois ; R. C. Aided School, Côte d'Or.

HOSPITALS.—Government Hospital Moka and the Sugar Estates Hospitals.

DISPENSARIES.—Moka, Pailles.

RAILWAY STATIONS.—Montagne Blanche, Quartier Militaire.

SPECIAL WATER SUPPLIES.—River St. Martin, Moka River, Espérance, Spring, River Profonde, Réduit.

ENGRAIS.—Mon Désert, Alma.

CEMETERIES.—St. Pierre, Espérance (Quartier Militaire) Pailles.

SPECIAL INSTITUTIONS.—Bacteriological Laboratory, Réduit ; Agricultural Department, Réduit ; Power Station, Réduit.

Various rivulets, canals, swampy areas, and anti-malarial works were also inspected.

The following memoranda have already been submitted.

195/R/73—School Latrines—11.8.21.

197/R/72—Alma Sugar Estate—11.8.21.

199/R/74—Pond at Beau Bois—13.8.21.

SANITARY STAFF.—In addition to a Sanitary Warden who has also Rivière du Rempart, Flacq and Pamplemousses under his care and who, at present, happens to be the Chief Sanitary Officer, the Moka District is served by 1 Sanitary Inspector, 2 Sanitary Guards, and 1 rat-catcher. There are also a few labourers. Neither the sanitary inspector nor the guards have had any special training. The inspector, I am glad to find, endeavours to

Moka.

Introduction.

Incidence of ankylostomiasis.

Prevalence of typhoid fever.

List of inspections.

Memoranda already submitted.

Sanitary Staff.

improve his knowledge by taking in the Sanitary Record. The latter, unfortunately, is not a journal dealing with tropical sanitation. As is the case everywhere, sanitary work is largely confined to making notes, keeping records and prosecuting offenders. Direct action in the way of abolishing nuisances appears to be non-existent. The result is not encouraging.

Towns & Villages.

St. Pierre.

Moka.

Mont Orry.

TOWNS AND VILLAGES.—For purposes of sanitation, ST. PIERRE, MOKA and MONT ORRY are considered as one village, the population of which is estimated at about 5,000.

**Engrais at Mon
Désert Estate.**

The night-soil and scavenging services are in the hands of a contractor who is paid Rs. 625 per month. For the night-soil service 12 men are employed to look after 3 carts and 822 tubs while the scavenging service is performed by 3 carts and 9 men. An area about 4 miles long is traversed. I am told that well-to-do people in Moka pay nothing for the night-soil service as the majority are interested in Mon Désert Estate where the engrais is situated. This engrais is merely a pile of ashes, straw and stable manure lying out in the open and in which the pail contents are more or less carefully buried. At the time of my visit, fowls were busy scratching on the heap and looking for fly maggots. The whole arrangement is dangerous in the extreme. The tubs are washed in a vat and thereafter are tarred. I am afraid the washing water is simply thrown on the manure heap or on the ground. There are many good class houses in Moka and in some of them septic tanks have been installed. It would be well if this practice were more generally followed. It should not be difficult if the Public Works Department take the matter in hand as recommended in my 215/R/87 of 22.8.21. Once it gives a lead private firms would no doubt follow suit and build tanks of a suitable type. Those at present manufactured are not wholly satisfactory. nd/

What may be called the commercial core of this village area is situated at St. Pierre. It is small and presents the usual sanitary features. The gutters are of a good type but ill-kept and drain into the River Profonde. It would be well if some soil filtration were arranged before this is permitted. There are no common lodging houses but there is a bakery where the floors are in bad state of repair and the walls require to be limewashed. Yeast is used in the bread-making and bran as "chapelure."

In one chinese yard a latrine was found draining into a pig-stye. There is no market and one is certainly required in this populous neighbourhood. Happily the water supply is derived for the most part from Mare-aux-Vacoas.

Petit Verger.

PETIT VERGER, CIRCONSTANCE AND AVENIR are large villages not very far apart. Petit Verger is an attractive place where fruits, flowers and vegetables are grown. It is supplied with Mare-aux-Vacoas water but there are many wells, the water of which is used chiefly for irrigation purposes. The well heads are covered but the covers are not sloped and the openings sometimes remain unguarded. Pulleys are provided for the well ropes. The area requires to be kept under close supervision.

The basins adjoining the wells require watching as they are very apt to harbour mosquito larvæ.

Circonstance.

CIRCONSTANCE is rather overgrown and is very crowded. There are some very clean and tidy houses but there are also the usual defects and this village might with advantage be taken in hand and improved on the lines recommended for Metcalfe, Beau Bassin.

Avenir.

Pailles.

AVENIR presents no special features.

PAILLES is very scattered and was formerly a most malarious locality. Important canalisation works have greatly improved it in this respect; the St. Louis River and the Pitot and Pailles streams having all been well trained and the work well upkept. At Pailles there is a night-soil service only for government establishments. One cart and 2 men are employed for the transport of 75 pails, the contents of which are buried in the manure heap at Mon Désert. The single cart has to traverse a great distance and it is clear that the work cannot possibly be properly performed.

There is no scavenging service, the refuse being burned but not in an incinerator.

There is a cemetery at Pailles which also serves the village of Moka.

**Quartier
Militaire.**

QUARTIER MILITAIRE.—Alma and Quartier Militaire together have a population of 2,617. The water supply is derived from streams and shallow wells. It could easily be improved by having recourse to the head springs of the St. Martin rivulet, which could be impounded by a dam, a catchment area of 10 acres being properly protected. This should certainly be done.

There is a small night-soil service for government establishments and a few private residences. The pail contents are taken to the open engrais (merely manure heaps) at Bonne Veine or Alma sugar estates. That at Alma is a dangerous nuisance (*vide infra*).

Generally speaking the private latrines are bad.

The other villages do not call for special mention. The largest is Montagne Blanche which is a scattered place of 2,854 inhabitants. Its night-soil service resembles that of Quartier Militaire. The pail contents go to Sans Souci and are dumped into open holes in the ground (*vide infra*).

There is no scavenging system. The railway station was found to be in a very insanitary condition.

MONTAGNE BLANCHE is a large village of 2,845 inhabitants. It was in a dirty state and no wonder as there is no scavenging service whatever. The night-soil service resembles that of Quartier Militaire.

Montagnes
Blanche.

SUGAR ESTATES.—SANS SOUCI.—This large and important estate presented several features of interest. It is a curious fact that *A. costalis* is rarely found breeding here although, to all appearance, every facility exists for its propagation and its larvæ are frequently discovered at no great distance. The reason for this immunity is not clear and should form the subject of an investigation which might possibly lead to some useful discovery. It may be that the chemical constitution of the surface waters at Sans Souci is not suitable for the water stages of the anopheline. I could get no information on this subject. There are several camps scattered about an area which is all ridges and hollows and which is seamed by water courses and canals. The water-supply is defective and typhoid fever is prevalent. I suggested to the Manager that either the supply of Montagne Blanche or Sebastopol villages could be tapped and a small chlorinating plant employed or that uncontaminated water could be obtained in the Bois Piston. Something should certainly be done at once to check the incidence of enteric. Once the Vaquois River scheme is completed, this estate should be able to procure pure water with little difficulty.

Sugar Estates.
Sans Souci.

Several of the camps were inspected. Most of them were overgrown with vegetation and their latrines and water supplies were alike unsatisfactory. Even when there was a spring, as at Queen Camp, it was not protected though this could easily be done. The hospital, as usual, had no special cupboard for poisons. It was provided with wooden beds which are apt to harbour beg-bugs and the wards were too crowded. The latrines are not good. An absorption pit is required to deal with sullage.

Estate hospital.

Near Madras Camp, the open pits for pail contents, to which reference has already been made, present a very dangerous nuisance. They are offensive and breed flies. It is imperative that they be abolished. The overseer promised to attend to the matter. Fuming pit latrines would be a great boon on this estate.

MELROSE.—This is a bad place with marshes and ponds in the neighbourhood. There is much malaria. The water supply comes from the Boucan River. The hospital possesses a good type of bed but is a wretched place, the building being ruinous, the bedding bad and the latrines abominable. It is time the Protector of Immigrants looked into the matter.

Melrose.

BONNE VEINE.—Camp lines regular but of an old type. Water-supply from Jacquart River. A few of the cowsheds were searched for adult anophelines but none were found.

Bonne Veine.

ALMA.—Some of the conditions in this camp were so bad that a special memorandum had to be submitted regarding them. (My 197/R/72 of 11.8.21). Amongst them was the filthy yard surrounded by cowsheds and containing a most dangerous manure heap in which pail contents are buried and the drainage from which flows into the Rivulet Canette.

Almas.

It is intolerable that a wealthy estate should permit this kind of death-trap, for it is nothing else, to exist. The hospital has wards of the back-to-back type which cannot be properly ventilated. It is necessary that arches should be cut in the partition. The beds are of a good type but the latrines are bad.

Estate hospital.

There is a still for sterilizing water which, like that for the camp is derived from streams and wells. The latter are partly uncovered.

There is much malaria which is not surprising considering that necessary anti-malaria works have been utterly neglected (*vide infra*).

Altogether this estate created a very unfavourable impression.

MON DÉSERT.—There are four main camps on this estate i.e. Mon Désert, Helvetia, l'Avenir and Gengly of which the first and third were inspected as was a small camp called Cascade on the Cent Gaulettes Road.

Mon Désert.

The first two receive Mare-aux-Vacoas water from the Dagotière and Réduit canals respectively. L'Avenir is supplied wholly from wells, and Gengly wholly from the Dagotière Canal. In Mon Désert camp, which is well laid out with wide alleys bordered by eucalyptus trees, the lines are of the usual type. There are enclosed gardens in front of the huts. These, as often stated, should be removed. There is a large manure heap which serves as an engrais. It is true that in this case the drainage from it does not

pass into a stream but it constitutes a dangerous method of disposal. At the time of my visit fowls were busy scratching for fly larvæ.

Estate hospital.

The hospital is of a good type, the wooden floors being well polished, the walls painted white and the wards generally clean, if bare and rather comfortless. Still they presented on the whole a bright and cheerful aspect in marked contrast to the ~~usual~~ dingy and depressing places one usually encounters. There is a large out-patient ward. The yard is both spacious and well kept and the kitchen is well built and on the whole suitable. The latrines unfortunately were in a filthy state but this is partly due to faulty construction, the seats being much too high. There was the usual lack of a separate poison cupboard in the dispensary. This hospital takes patients from the other camps of Mon Désert Estate.

Avenir.

AVENIR is a small estate with camp lines of an old type.

Beau Bois.

BEAU BOIS.—Here again there are poor lines of an old type and there are also the ordinary kind of coolie dwellings. The place is much overgrown with vegetation and requires to be cleaned up and put in order. A proper water-supply is required and could easily be obtained from Moka River above the dam.

Cascade.

CASCADE has only a few lines and draws its polluted water from the river of the same name.

Côte d'Or.

CÔTE D'OR.—This camp is very well situated but, like so many others, requires to be cleared of superabundant vegetation. The huts are of the usual type. The water-supply is bad, being drawn from a canal which taps the Cascade River. The camp is some 2 miles away from the Mare-aux-Vacoas pipe line. It would pay to lay a special pipe from the latter. The latrines, of the customary kind, were found in a dirty condition. Pail contents are buried in a manure heap. The hospital is fair, the wards being well ventilated and the beds of a good type. I was glad to see that tin-foil "stick-fast" traps were in use for flies and to hear that they had been successful. Soil dressings are buried in a pit with lime. The yard was tidy, the latrines fair. The water supply is derived from a well sunk to a great depth. There is a metal cover but the central aperture is unguarded and there is a risk of pollution. I found that the prevailing diseases were influenza and dysentery. There is also some malaria.

Estate hospital.

SCHOOLS.—In this report I consider all the Moka schools together instead of under the villages or localities in which they are situated.

Schools.

R. C. Aided School, Quartier Militaire.—Pupils on roll 59. Average attendance 33. Illness of various kinds, especially influenza, is stated to be the chief cause of absence. Crétin's book is used for teaching hygiene. The latrine for boys was in a filthy and ruinous condition. That for girls was surprisingly good, there being a fly-proof box seat surrounding the tub.

C. of E. Aided School, Quartier Militaire.—Pupils on roll 220. Average attendance 150. The causes of absence were stated to be chiefly poverty and bad weather. There was said to be little illness beyond some dysentery. For all that this is the school in which Dr. Kendrick found a 100 per cent. infection with ankylostomiasis. This is not surprising considering the abominable state of the latrines and the approaches thereto. They were so bad that I felt it my duty to direct special attention to the matter (My 195/R/73, of 11.8.21). Nevertheless in this school the Headmaster takes a real interest in teaching hygiene. He has made a synopsis of his text-books, the walls are covered with sanitary maxims, the pupils can answer simple questions correctly. Yet in addition to the state of the latrines, the school is overcrowded and pediculosis is common.

All this shows the evil of divorcing theoretical from practical instruction and the futility of the present system (See Report on the Beau Bassin-Curepipe area).

C. of E. Aided School, Montagne Blanche.—Pupils on roll 384. Average attendance 247. The water supply comes from Saas Souci estate. I was told by the Headmaster that there was little illness and that even in the summer there were not many mosquitoes. He uses Crétin's book on hygiene in which he evidently takes an interest for he had erected quite a large number of latrines of quite a creditable type all things considered, and told me he intended to replace the remaining old ones which are unsatisfactory.

It is true the seats of the new latrines are too high but this is due to the risk of splashing. The suggestion was made to lower the seats and use some earth or saw-dust in the pails.

R. C. Aided School, St Pierre.—Pupils on roll 190. Average attendance 103. Chief causes of absence stated to be poverty and influenza. The school building is of a good type. Crétin's book on hygiene is used. The spleen

index is small. The latrines were found in the filthiest condition imaginable, In one compartment there was no receptacle and an excretal accumulation of many days replaced it !

R. C. Aided School, Helvetia.—Pupils on roll 150. Average attendance 101. Chief causes of absence stated to be poverty, influenza and scabies. Dr. Crétin's book is used. None of the children show enlarged spleens. The school precincts were dirty and the latrines filthy. In 3 compartments there were no receptacles.

GOVERNMENT SCHOOL, MOKA.—(Bois Cheri Road) Pupils on roll 187. Average attendance 120. There is not sufficient accommodation though better use might be made of that available, some of the desks being quite unnecessarily close to one another. It was noted that there was a special cupboard for hats, the first seen in a government school in Mauritius. There is said to be little illness amongst the pupils and that, as a result of preventive measures, pediculosis has declined.

Both Pouzet's and Crétin's books on hygiene are used. The school yard was untidy and fouled by excreta in one place. The latrines were of the usual unsatisfactory kind.

R. C. Aided School, Pailles.—Pupils on roll 64. Average attendance 43. Causes of absence, poverty and malaria. The spleen index is high. The latrines were found to be fairly clean. The water-supply is derived from the Pailles Canal and is liable to pollution.

Government School, Beau Bois.—Pupils on roll 142. Average attendance 101. Absences due to poverty, long distances to be traversed, bad weather and illness, especially malaria and dysentery. Crétin's book on hygiene is employed. The latrines were found to be clean. Pail contents are conveyed to a manure heap at Beau Bois Estate.

R. C. School Côte d'Or.—The school was closed on the day I visited it but the yard was found untidy and the latrines very defective. The pail contents go to a manure heap at Côte d'Or Estate.

It will be seen that the sanitary condition of the schools generally left much to be desired and that there are many absences owing to illness. In Moka, as elsewhere, the whole school system requires revision from an hygienic point of view and the teaching of hygiene must be radically altered if it is to be of any avail.

RAILWAY STATIONS.—*Montagne Blanche* and *Quartier Militaire* were the only stations inspected in Moka as it has been found that nearly all the railway stations are more or less on an equal footing as far as sanitation is concerned. *Montagne Blanche* is a dirty station with filthy latrines. The conditions at *Quartier Militaire* were distinctly better.

Railway Stations.

SPECIAL WATER SUPPLIES.—Reference has already been made to the advisability of damming the St. Martin stream, protecting the catchment area and supplying *Quartier Militaire* with pure water. *Beau Bois* might easily be supplied from *Moka River* which, far up its course, is fairly pure.

Special Water Supplies.

Espérance hamlet is supplied from a stream which has had a dam thrown across it. The supply seems fairly satisfactory as it is derived from an upland district but sparsely inhabited.

Near the bridge over the *River Profonde* at *Réduit* there is a rock spring discharging by a pipe. The supply is good but should be more adequately protected.

CEMETERIES.—These do not call for special notice. That at *St. Pierre* presents the usual mosquito-breeding nuisance about which I have written repeatedly in vain.

Cemeteries.

Sanitary guards should not be taken from their duties to replace cemetery keepers as I found was the practice in *Moka District*.

SPECIAL INSTITUTIONS.—The *Bacteriological Laboratory*, an excellent and valuable institution, will be considered in my report on medical matters.

Bacteriological Laboratory.

The *Agricultural Department* must always be more or less associated with the sanitary work of the Island and more especially in connection with entomological problems. The Director and his staff have been good enough to aid me in several directions.

Agricultural Department.

The *Power Station*, *Réduit*, is situated in the gorge of the *Grand River* N.W. sometimes called the *River Cascade*. The locality is somewhat malarious and there is a great number of *Stegomyia albopicta* in the woods.

Power Station Réduit.

MARSHES AND ANTI-MALARIAL WORKS.—Some very useful work has been done in *Moka* in the way of draining swamps and training and canalising rivers and streams. Special mention may be made of that carried out on the tributaries of the *Boucan River* and on a part of the *Boucan River* itself.

Swamps.
Anti-malarial works.

Again a most interesting and successful operation is to be seen at Pailles where the St. Louis River and its tributaries, the Pitot and Pailles streams have been dealt with in an effective manner. Here and there the springs welling out from the rock forming one bank of the St. Louis River still require careful watching.

In marked contrast to the changes effected in these places is the result of of carelessness and neglect found here and there on sugar estates and more especially at Alma. Here, in spite of repeated representations, very little has been accomplished. I found the small stream Le Riche overgrown and breeding out anophelines, both *A. costalis* and *A. mauritianus* even early in August. In the summer I understand it is a hot-bed of mosquito life and a source of peril to health and life.* Nor is this all, for there are marshes near the estate hospital and there is also the Jacquart marsh which has been partly drained but is not properly looked after and is in a bad condition. The state of affairs was so serious that I felt it my duty to direct special attention to it (My 197/R/72 of 11.8.21). I trust that steps will be taken at an early date to put an end to this serious nuisance and danger.

It does not yet seem to be generally recognized in Mauritius that to permit anophelines to breed out in places where this could easily be prevented is, to all intents and purposes, a crime. It should certainly be treated as such and then there would be far less malaria in the Island.

Near *La Dagotière* an irrigation channel had been permitted to form a regular marsh in a cane-field. All the cane-field irrigation in this locality requires special supervision. As regards the works still calling for execution one may note the necessity for cleaning and rough training the Terre Rouge stream from its junction with the River Cascade to the place where it diverges from that river. Similar treatment should be accorded the River Cascade itself for a distance of three miles above the Cascade bridge. A part of the River Moka in the neighbourhood of Roselyn Cottage requires attention as does its tributary the Baptiste. The River Profonde which courses through Réduit should be included in the programme, at least that part of it near Moka Hospital, and so should certain stretches of the River Boucan, more especially its upper reaches.

A pond at Beau Bois should be abolished. This can easily be done by cutting through a retaining dam and has already been the subject of a communication (My 199/R/74 of 13.8.21). Generally speaking it should not be difficult to lessen very materially the incidence of malaria in Moka, but the good-will and hearty co-operation of the landowners is required and would surely be given if they only understood the benefits which would be certain to accrue.

If they lack either the sense or the desire to help then firm action must be taken and they must be made to realize their responsibilities towards the public.

Pamplemousses.

PAMPLEMOUSSES.

This district furnishes an example of decadence owing largely to the introduction of malaria. At the same time it still possesses a large population of 37,476 and is an important sugar-growing area. As the rainfall is light the cane cannot in many parts be grown without irrigation and as usual, irrigation brings with it trouble to the hygienist. The incidence of ankylostomiasis is comparatively small, Kendrick placing it at 55.6 per cent.

Pamplemousses differs considerably from the Black River District for its hills are much farther from the sea coast and there is therefore a much greater expanse of comparatively flat land which in certain parts is very dry and arid. There are numerous rivers, streams and canals. The population is scattered, there being no large town. The inspections comprised the following :—

List of inspections.

VILLAGES.—Pamplemousses, Terre Rouge, Calebasses, Notre Dame, Ruisseau Rose, Crève Cœur, Pointe aux Piments, Triolet, Trou aux Biches, Plaines des Papayes, Congomah.

SUGAR ESTATES.—Solitude, Bon Air, Belle Vue, Maison Blanche, Industrie, Grande Rosalie.

SCHOOLS.—Government School, Pamplemousses ; Government School, Plaines des Papayes ; Maheshwurnath Aided School, Triolet ; R. C. Aided School, Trou aux Biches ; Government School, Crève Cœur ; Government School, Congomah.

HOSPITALS.—Government Hospital, Long Mountain and the Sugar Estates Hospitals.

DISPENSARIES.—Pamplemousses and Terre Rouge.

* Since my inspection this stream has been cleaned.

RAILWAY STATIONS.—Riche Terre, Terre Rouge, Pamplémousses and Long Mountain.

SPECIAL WATER SUPPLIES.—Bathurst Canal, Calebasses Dam, Bassin Louloup, Bois Mangue Well, Trois Canons Well and Plessis Spring.

ENGRAIS.—Stanislas, Bon Espoir.

CEMETERIES.—Bois Marchand, Pamplémousses.

SPECIAL INSTITUTIONS AND WORKS.—Powder Mills; Observatory; Calebasses Infirmary; Pamplémousses Infirmary; Quarantine Station, Canonnières Point; Botanical Gardens; Nicolier Dam.

Various rivers, rivulets, canals, swamps and anti-malarial works were also inspected.

The following memoranda have already been submitted :—

Memoranda
already
submitted.

35/R/ 12 of 22.4.21 : Hospital Accommodation for Lepers, Powder Mills.

137/R/ 51 of 21.6.21 : Plessis Spring.

200/R/ 75 of 13.8.21 : Headmaster's House, Congomah.

201/R/ 76 of 13.8.21 : Pond at Grande Rosalie Estate.

204/R/ 77 of 13.8.21 : Cutting of trees in River Reserves.

227/R/ 96 of 1.9.21 : Wells at Triolet.

228/R/ 97 of 1.9.21 : Quarantine Station, Pointe aux Canonnières.

229/R/ 98 of 1.9.21 : Government Hospital, Long Mountain.

230/R/ 99 of 1.9.21 : Calebasses Infirmary.

231/R/ 100 of 1.9.21 : Pamplémousses Infirmary.

232/R/ 100 of 1.9.21 : Sugar Estates.

Sanitary Staff.—The Sanitary Warden of the District, who happens to be the Chief Sanitary Officer, has also to look after Moka, Flacq and Rivière du Rempart, an impossible task. There is one Sanitary Inspector controlling 2 Sanitary Guards, a market and abattoir inspector, one labourer and one messenger. The usual deficiencies and faults exist and need not be detailed.

Sanitary Staff.

VILLAGES.—PAMPLEMOUSSES, though the capital of the District, has only 804 inhabitants. It is a proclaimed village and so possesses a night soil service performed by 1 cart and 4 men. Pail contents go to Bon Espoir engrais. The refuse and street sweepings are burnt at Beau Plan Estate. There is a good market building, which, however is now scarcely used at all. It drains into a road gutter. There is a public abattoir of a fair type which I found in a cleanly condition. The offal is placed in a large covered pit of good design. Unfortunately the cover, a pent roof of corrugated iron, is damaged so that flies gain access to the contents. The place should be repaired. A small covered and fly-proof cart conveys meat to the butchers' shops. The solitary bakehouse, owned by a Chinaman, was found to be of fair construction but it requires whitewashing. The dough is hand-mixed, yeast is employed and bran used as "chapelure." There is no communication with a dwelling house or latrine.

Villages
Pamplémousses.

There is a place in Pamplémousses which may be termed a *Separated Milk Depot*. It is owned by an Indian "middleman" who removes the fat from the milk, boils the resulting product and sends it out for sale. The conditions are very primitive and the milk in the open vessel used for boiling purposes was very dirty. Action will have to be taken as regards all these places.

TERRE ROUGE and CALEBASSES may be considered together. The former has a population of 1,878, the latter one of 1,916. They have a night soil service in common, 3 carts and 9 men being employed. The tub contents go to Roche Bois Manure Factory. For scavenging purposes there are 2 carts 2 men and 8 sweepers. The villages are long stretches of scattered houses and shanties, for the most part of a poor type. The water supply is from the Calebasses River and is grossly polluted. It is proposed to replace it by water from Plessis Spring.

Terre Rouge and
Calebasses.

NOTRE DAME, RUISSEAU ROSE and CRÈVE CŒUR are all in the Long Mountain Area. The first has a population of 1,498, that of the other two amounts to 2,153. Despite the large number of inhabitants there is only a night soil service for government institutions. There is neither a market building nor a Slaughter-house. The water supply is piped from Bassin Louloup at the source of the Bouligrin Rivulet (*vide infra*).

Notre Dame,
Ruisseau Rose,
Crève Cœur.

POINTE AUX PIMENTS is a fishing village of 1,535 persons. Just prior to my visit influenza had been very prevalent and I found a whole family suffering from scabies. The people complained bitterly of having to go all the way to the dispensary at Pamplémousses in order to get medicine.

Pointe aux
Piments.

At TROU AUX BICHES, a tiny place on the coast with small marshes near it, there was the same complaint. It is clear that a dispensary is required at Triolet.

Trou aux Biches.

Triolet.

TRIOLET is the largest village in the district. It has a population of 3,663 and is a very long and straggling place situated on either side of the Cannoniers Point Main Road for a distance of about 3 miles. There is no night-soil or scavenging service. The village conforms to the usual type but possesses a considerable number of better-class houses built by well-to-do Indians. They form a pleasing contrast to the prevailing hut or hovel and some of them are well constructed and of tasteful design. They show that the Indian can appreciate a good house and will take the trouble to construct one when he has the means. The water supply is derived from a large number of wells. Most of them are of the usual open type favouring contamination but some have been properly covered and have had pumps affixed. Unfortunately both covers and pumps were being removed for some unknown reason and without reference to the sanitary authorities. I asked that an enquiry be instituted (My 227/R/96 of 1.9.21).*

All the wells in the village should be protected and provided with hand pumps unless it is found cheaper to sink one large well, affix a pump and oil engine and lay on a piped supply, a reasonable proposition if enough water can be obtained. 40,000 gallons per diem would probably suffice for all purposes. Perhaps the requisite amount could be obtained from the big well at Bois Mangué, or from a well at St. André.

Plaines des Papayes.

PLAINES DES PAPAYES.—Although a proclaimed village there is no night-soil service. It is a small place but there are a good many people in the locality and FOND DU SAC some distance off which I did not visit has a population of 1,736. Both Plainés des Papayes and Belle Vue (Harel) Estate are supplied with water from the Bois Mangué Well.

Congomah.

CONGOMAH is a surprisingly clean little hamlet looking down on Nicolier and the plains.

Sugar Estates Solitude.

SUGAR ESTATES.—*Solitude.* In several particulars this estate was found very far from satisfactory. Anti-malarial work is neglected, the Ruisseau Pyrame being badly upkept and water cress being actually grown in it. I took the larvæ of *A. costalis* in the stream. The matter has been reported (My 232/R/101 of 1.9.21) and immediate action should be taken to prevent a breed-out. The camp lines are fair and not much overgrown. The latrines are merely grass shelters with earthen floor. They appear to be little used. The hospital is a good type of building with a tiled roof, but the female ward is badly ventilated and has a defective door. The male ward is better but there are windows only on one side of it, hence there is no through draught. There are wooden beds which are said to harbour bugs. The latrines are fair but one of them is in a ruinous condition. I was told that there is only one night-soil labourer for the whole estate. He has no cart and has to handle about 30 pails. The contents of the hospital pails are thrown into a cane-field! The water supply which comes from the Bassin Mervén is liable to pollution and the storage arrangements are disgraceful, there being merely an uncovered metal vat. I found the water full of leaves and dirt. A Maille filter is used at the hospital but no filter can be absolutely relied upon to purify water. The hospital yard is not well kept. The prevalent diseases are influenza and malaria. Filariasis also occurs and cases of schistosomiasis (bilharziasis) are said to be fairly common.

Estate hospital.

I have directed attention to the dilapidated condition of the quarters in which the Dispenser-Steward lives. The boarding of the walls is rotten in places and the windows and doors broken. Altogether this estate created a very unfavourable impression and should certainly be called sharply to account.

Ben Air.

Bon Air.—Here there are old and new camp lines. The latter are fairly good and possess windows. The former are poor and some of the rows contain more than six rooms, contrary to regulations. The lines are not much overgrown.

Estate hospital.

Water is supplied from a large well and is pumped up by a gas engine. Unfortunately it is stored in barrels some of which breed stegomyia in thousands. In others, however, there are "millions" which keep the water free from larvæ. The hospital is of rather a good type, there being ventilation under the eaves. The beds have wooden frames and metal bands. The bedding was dirty at the time of my visit. The latrines require repair.

Belle Vue.

Belle Vue (Harel).—The camp lines are rather overgrown. New rows of dwellings, without windows have been erected. There is a much better type of cow-shed than usual with a ridge roof. The cost of each shed was only Rs. 70 and they are certainly an improvement on the usual low dark structure.

*A satisfactory reason has since been furnished.

The hospital, which is well thatched, has badly ventilated wards. The doors are merely makeshifts of stout sacking painted which, in places, is torn. The flooring requires repair. There is no isolation ward. The water supply is brought by cart from a well. The latrines are fair but were dirty and untidy. I was glad to see an incinerating pit for the cremation of refuse soiled dressings and infected stools. Estate hospital.

Maison Blanche.—Some time ago there was a fire at this estate and some new camp lines had to be built. These have been constructed with "ravenal" sides and corrugated iron roofs ventilated under the eaves. They are much better lighted and ventilated than the usual type of camp dwelling but unfortunately are not very well built. Still the plan might be developed though possibly such houses will be found cold in winter and rather hot in summer. The hospital is a poor place, the wards being not much better than cubicles. The central compartment has two doors opposite each other, but no window. The water supply is obtained from the grossly polluted Pamplémousses River. One of the latrines was found in a ruinous condition. The dispensary was clean but, as usual, contained no special poison cupboard. As elsewhere I found that ordinary diet is prescribed for cases of dysentery and diarrhoea. This consists of salt fish or dholl, rice, ghee or oil and salt. Now and then I find milk is ordered as an extra but this is by no means invariably the case. Comment is surely superfluous. The matter has been reported. The chief diseases at Maison Blanche are influenza, malaria and dysentery. Maison Blanche.

Industrie.—The camp lines here are fair. Some of the rooms are furnished with windows. The latrines were filthy. Their contents go to a manure heap. There is a spring on this estate, the stream from which is badly upkept and contains green algæ and water cress. The proprietors should be made to look after it properly. The hospital consists of an old stable which has been converted into wards. It is fairly good with sufficient light and ventilation and a satisfactory floor. The latrines were clean. Influenza appears to be the prevailing disease. Cases of schistosomiasis occur in the locality. Industrie.

Grande Rosalie.—The camp lines are well laid out and not much overgrown. The latrines are of the usual unsuitable type. The water supply is derived from a spring. The hospital is of a good type and well ventilated. There is, however, no isolation ward. I found a case of typhoid fever being treated in the ordinary male ward. He was covered with flies and nothing was being done to prevent their gaining access to him or in the way of destroying them. The recommendation was made to place the case under a mosquito net. The hospital latrines are in a substantial building with good floors. Malaria and dysentery appear to be the prevalent diseases. In the case of the latter "ordinary diet" is prescribed. Grande Rosalie.

Pail contents are buried in a large manure heap. At the time of my visit fowls were scratching for a living upon it and ducks and geese were also seeking a livelihood from it. Indian children were going and coming upon its filthy surface and watering it with drainage effluent and syrups. A memorandum has been submitted asking that this practice be discontinued. On other estates the watering is done by means of a special apparatus. Estate hospital.

The pond above the dam on the Pamplémousses river is supposed to be looked after by Grande Rosalie. The work is very badly done, the pond being full of weeds while reeds have been permitted to grow in it. Attention has been directed to the matter and it is hoped speedy action will be taken.

Speaking generally the sugar estates seen in Pamplémousses require to be brought up to the mark. They are for the most part defective in sanitation and in hospital provision and some of them are sources of danger to the community.

SCHOOLS.—My inspections were made during the holiday season and thus I was unable to see the children at work, examine any of them or get full particulars in all cases. Schools.

Government School, Pamplémousses.—This is a large school. The latrines are in a good stone building. The water supply is from the Plessis spring.

Government School, Plaines des Papayes.—Pupils on roll 154. Average attendance 90. Chief causes of absence stated to be measles and influenza. Spleen index small. Crétin's and Pouzet's books used in teaching hygiene. Water supply piped from the Bois Mangue well but stored in open metal vats and so liable to pollution. This should be stopped. School building not weather-proof and too small. Yard untidy. Two pit latrines, both filthy and dilapidated. This school, like many others, requires immediate attention. self

Maheshwurnath Aided School, Triolet.—This school was closed. I found the pit latrines had been badly constructed and were much in need of repair and that flies gained access to their contents.

R. C. Aided School, Trou aux Biches.—Pupils on roll 65. Average attendance 30. Water is derived from brackish wells. There are no latrines of any kind. The spleen index is small. This is a school where the sanitary concrete privy vault might be tried at an early date provided occasional labour can be obtained for removing the pit contents.

Government School, Crève-Cœur.—It was closed for the holidays. Two pit-latrines were found in a dirty and ruinous condition.

Congomah Government School.—Pupils on roll 89. Average attendance 50. Chief causes of absence stated to be influenza and malaria. Crétin's book on hygiene used. The water supply is derived from a spring. There are two pit latrines in fair condition.

The schoolmaster's house is a most unsatisfactory dwelling, being merely a closed-in verandah without proper ventilation and in a bad state of repair. It has formed the subject of a special memorandum, as the place is unfit for human habitation.

Railway Stations.

RAILWAY STATIONS.—Little need be said regarding these. There was a manure nuisance at *Riche Terre* and *Terre Rouge* but it has been abolished. The *Pamplemousses* Station was fairly clean and the latrines well constructed. *Long Mountain* Station was moderately clean. The women's latrine was fair. The men's latrine, at a short distance from the station, has a good floor but the urine-pit requires repair. The station master was unable to tell me the terms of the removal contract. He believed it was two or three times a week.

Special Water Supplies.

Bathurst Canal.

Upper Calebasses dam.

Bassin louloup.

SPECIAL WATER SUPPLIES.—The dam where the *Bathurst Canal* leaves the *Calebasses River* was visited. The water is polluted and the supply should either be discontinued or chlorinated. A combination of precipitation and chlorination is really required for at times there is much suspended matter. The same is true of the *upper dam* where water is drawn for the supply of Calebasses, *Terre Rouge* and *Le Hochet Villages*. The *Bassin louloup* is an interesting place at the head of the *Boulingrin Rivulet* and near the base of *Pieter Both Mountain*. It is a natural hollow, formerly a swamp, which has been drained and from which water is now collected partly from a spring and partly by sub-soil channels and conveyed by a covered concrete aqueduct to pipes. An intercepting drain runs all round the catchment area. There would seem to be no chance of pollution, which is fortunate, as the *Bassin* is the source of supply of the whole of *Long Mountain District*.

Bois Mangue Well.

The *Bois Mangue Well* is an important source of supply furnishing water to *Plaines des Papayes*, *Fond du Sac* and *Belle Vue (Harel) Estate*. There is always 20 to 23 feet of water in the well which is very large and from which the water is pumped to tanks holding 11,150 litres. There is a good concrete cover but two small openings in it are not provided with covers as should be the case.

Trois Canons Well.

The *Trois Canons Well* is situated not far from *Canonnières Point*. It is a shallow well, not steined and yet it furnishes a large supply of water and is much in request. It is uncovered and has a hand pump affixed. This well should certainly be properly covered and its walls rendered in cement concrete to a depth of at least ten feet.

Plessis Spring.

Plessis Spring supplies water to *Pamplemousses Village*. It represents a discharge of underground water but the latter is very superficial and is liable to contamination from surface washings. The area of the spring itself has been roughly covered over but there can be no doubt that, under existing conditions, the supply is not sufficiently protected from contamination. To deal merely with the spring itself by closing it in with cement concrete would not be sufficient. It is necessary to protect the catchment area. This has an extent of six arpents and should be enclosed by a barbed wire entanglement.

Engrais Stanislas.

ENGRAIS.—The *Stanislas Engrais* is now little used but a certain amount of night-soil from the eastern suburbs of *Port Louis* still goes there. It is of rather a peculiar type, having an aperture in the roof. At the time of my visit the walls required repair and the building was emitting through holes and cracks an abominable stench due to the putrefying carcase of a calf which had been thrown into it. All round it were piles of refuse. The *Bon Espoir Engrais* is fortunately far from any human habitation for, though used, it still remains unfinished, there being a large gap in one of its walls serving as a portal to crowds of flies. It should be properly closed prior to abolition or conversion into a "smoke engrais."

Bon Espoir.

Cemeteries

Bois Marchand.

CEMETERIES.—The large *Bois Marchand Cemetery* was found in an untidy and uncared for condition. It has already been mentioned in my report on *Port Louis*.

The drainage, as stated, passes into the already polluted Bathurst Canal. The other cemetery visited was that at Pamplemousses. I did not find any mosquito nuisance here because those who own the grave now live so far away that they can only pay infrequent visits and so do not keep the flower-vases full of water.

Pamplemousses.

15/

SPECIAL INSTITUTIONS AND WORKS.—Powder Mills has already received attention in connection with the scheme for a new leper asylum (Vide Report on Communicable Diseases in Port Louis). The mosquito-netting at the Observatory is badly in need of repair. This work should at once be undertaken. Defective mesh is worse than none at all. The two infirmaries will be considered in my medical report.

Special
Institutions
Powder Mills.
Observatory.

The Quarantine Station at Canonnières Point is at present used only as a sea-side resort and most of the buildings are closed. It is well situated but I am told that when it is used for quarantine purposes there is always trouble owing to persons under quarantine surreptitiously stealing out of it either by boat or on the land side. This, of course, points to faulty arrangements of some kind but it seems to me that matters might be improved if a proper barbed-wire entanglement of military type were erected instead of the existing single fence.

Quarantine
Station,
Canonnières Point.

Fence.

It is admittedly more difficult to guard the sea front but it should not be impossible. If necessary, a proper entanglement could be run along that side of the camp save opposite the landing and bathing stages where there could be guarded entrances.

The suggestion has been made to cut a canal round the station, admit sea water and convert it into an island but I do not think the expense involved would be justifiable.

As a result of my inspection I considered it necessary to submit the following notes, more especially as cases of dysentery and paratyphoid fever have been known to occur at the station.

The latrines attached to the hospital are not at present supposed to be used and consequently possess no receptacles. The doors, however, are not kept locked and hence some person has been easing himself in the latrine despite the absence of a pail. I found an excremental deposit on the floor which had been there for some time. The door of any latrine not in use should always be kept locked or should be nailed up. A similar deposit was found on the slats in what I understand is a bathing-box.

Latrines.

nd/

The premises of the native caretaker are badly placed, being near the first-class quarters. They were also at the time of my visit in a very dirty condition, refuse of all kinds having been thrown out on the ground.

Dirty premises.

The pump of the rain water tank near the first-class quarters is out of order and water has to be obtained by buckets, as indeed is now the case with all the reservoirs. This is apt to lead to pollution. Moreover, in the case of all the water tanks, it is not the practice, as it should be, to reject the first washings from the roofs. Hence various kinds of impurities may find their way into the tanks.

Water supply.

The first washings may be got rid of by the use of a Robert's rain-water separator or, more simply, by employing the rain water-pipe as a discharge pipe for the first washings, then plugging it at the bottom and allowing the secondary clean washings to rise in it to a point where a communication pipe joins the rain pipe. Along this communication pipe water passes to the storage tank.

A fine wire mesh should be fixed at the pipe junction to exclude suspended matter.

The most important point is to see that all chance of pollution of drinking water is obviated as far as possible. Every tank should have a pump in good working order or, if it can be arranged, a syphon tube which would be more economical. The pump, however, is safer.

For the rest this Quarantine Station is incomplete without a field laundry an incinerator and a disinfectant. All these should be provided.

BOTANICAL GARDENS.—These were formerly a fruitful source of mosquitoes but I am told that the present Director of Agriculture has done much to improve the local conditions and that he follows the advice of the Chief Sanitary Officer. The presence of so many fish especially *Madam Céré* in the ponds must be helpful.

Botanical
Gardens.

NICOLIER DAM.—This extensive work, when completed, will impound a huge volume of water.

Nicolier Dam.

So far as its immediate effects are concerned it is likely to be beneficial from a sanitary standpoint, as many potential breeding places for *A. costalis* will be obliterated. At present the Nicolier stream requires careful watching.

The more remote effects are difficult to gauge. A huge irrigation reservoir will furnish a large supply of water and there is certain to be trouble unless due control is exercised. I would suggest that before any irrigation from Nicolier is permitted a series of regulations should be drawn up on the advice of the Director, Medical & Health Department.

Marshes,
Anti-Malarial
Works.

Marshes.

MARSHES AND ANTI MALARIAL WORKS.—A great deal has been done in the Pamplemousses District in the way of combating the malaria-carrying mosquito, more especially in its central and south-western portions. As a result there are now only a few swampy areas requiring attention and most of these are gradually being abolished, for example the marshes in the neighbourhood of Beau Plan and St. André. On the Balaclava Estate there still remains, however, a small swamp where anopheline larvæ can be found even in August and which could, without much difficulty, be drained to the sea. There are also small marshes behind Trou aux Biches and undrained areas at Mon Rocher but the main task has been accomplished so that sugar-cane has usurped the former domains of frogs and tadpoles and malaria vectors.

Danger of
irrigation.

In Pamplemousses the chief question at present is to complete the work on streams and rivers and to see that irrigation does not undo the labour of years.

Rivers and
streams.

The necessity of placing all anti-malarial works under one responsible authority is nowhere better exemplified than in the lower part of the Tombeau River.

Here from Powder Mills road downwards, the stream has been canalised and is carefully upkept by the Medical and Health Department to within three-quarters of a mile from the sea but, thereafter, it is in charge of the Forest Department and the change is abruptly marked, for, beyond a certain point, it is full of reeds and weeds and it is nothing but a long mosquito nursery. The lower part of the Citron River is in the same state. The Pyrame Rivulet, a menace to the public health, has already been mentioned. Part of the Calebasses River still remains in a dangerous condition and there are other natural water courses requiring attention as well as irrigation canals like that of Masilia. Yet I think there can be little doubt that malaria has been to a large extent scotched in Pamplemousses and with intensive work during the winter months and concerted action by all interested it should be possible still further to reduce its incidence. Special attention should be directed to the syphon pits of irrigation canals in cane-fields as under certain conditions they are very liable to become mosquito nurseries.

Summary of
Recommend-
ations.

SUMMARY OF MORE IMPORTANT RECOMMENDATIONS.

1. Appointment of a Medical Officer of Health for the two districts of Moka and Pamplemousses. He could reside in Moka.
2. A second Sanitary Inspector to be appointed for the Pamplemousses District.
3. A market to be built at St. Pierre.
4. A water supply for Quartier Militaire, Moka, to be obtained from the St. Martin springs.
5. The water supply of Triolet, Pamplemousses, to be improved either by utilising and safe-guarding the local wells or by tapping the supply from the Bois Mangué well.
6. The Trois Canons well to be properly covered.
7. The Plessis Spring supply to be adequately protected.
8. Necessary action to be taken as regards the supply from the Calebasses River. The question of chlorination to be considered.
9. Investigation to be made at Sans Souci to determine the reason for the rarity of *Anopheles costalis* there.
10. Energetic prosecution of anti-mosquito work, especially during the winter, both in Moka and Pamplemousses on the lines indicated in the report.
11. Sugar Estates to be compelled to co-operate in, or to contribute towards, anti-malarial operations.
12. The mosquito-proofing at the Observatory, Pamplemousses, to be repaired.

13. Action to be taken in the way of getting the insanitary conditions prevailing on many sugar estates abolished and of improving the estate hospitals and the dietary for patients, more especially those suffering from dysentery.

14. Improvement of the conditions at the Quarantine Station, Canonnières Point, on the lines indicated and the provision there of a field laundry, a small incinerator and a portable disinfecter, say a Lelean steam sack disinfecter.

15. A radical change in the latrine system for schools and various other measures, already mentioned in previous reports, and which are applicable to the districts under consideration.

As this concludes the series of sanitary reports I would like to take the opportunity of mentioning how impressed I have been by the invariable courtesy and good nature shown by all whom I have met in the course of my inspections. Although it has been necessary to enter private premises, to point out faults and to trouble people with enquires of all kinds I do not think I have encountered a single surly or ungracious individual. In no other country with which I am acquainted could one take similar liberties with such impunity. There appears to be a natural courtesy amongst every class of the community which certainly renders what is usually a thankless task much more pleasant and agreeable than would otherwise be the case.

Acknowledgments.

I am indebted to many persons with whom I have come in contact; not only for the information and facilities furnished me but in some instances for most kind hospitality. It is impossible to mention everyone by name and save in some special instances it would be invidious to single out individuals, so I would content myself with thanking very heartily all those who have been good enough to assist me in any way.

Mr. Walter in particular has been at pains to furnish me with figures and statistics and I have received much information and help from the Hon. Director of Public Works and his Assistant, Major Regnard, R.E.

To Dr. Castel I owe a special meed of thanks inasmuch as, often at great inconvenience to himself, he has accompanied me to well-nigh every part of the Island and has placed his unrivalled knowledge of its sanitary problems freely at my disposal.

Dr. Keisler acted as my guide to the Black River District with which he is well acquainted and gave me much information regarding it.

I have had the advantage of conferring with Dr. Momplé on various matters and Dr. Barbeau enlightened me on several points of bacteriological interest.

Mr. d'Emmerez de Charnoy has kindly aided me in matters entomological. As stated, Dr. Tempany has carried out an experiment on cowshed floors and has taken up the matter of the cultivation of the plant from which chenopodium oil is obtained.

My Secretary, Mr. Chastellier, has been assiduous in his note-taking and his knowledge of the country and of local conditions has frequently been of service.

Conclusion.

No one is better aware than I am that these reports only give an outline of the sanitary state of the districts. In the time at my disposal it has been impossible to enter as fully into details as I would have liked. As far as possible however, care has been taken to give a faithful account of what has come under notice. I hope therefore that the records submitted may prove useful, both in the way of furnishing information and as an indication of what must be done if Mauritius is to regain that reputation for salubrity which once made it the resort of those in quest of health and pleasure.

I have the honour to be,

Sir,

Your obedient servant,

ANDREW BALFOUR.

